REMARKS

Applicant requests reconsideration of the present application in view of the foregoing amendments and the discussion that follows. The status of the claims is as follows. Claims 1-25 are pending. Claims 12-25 have been withdrawn from consideration. Claims 1, 3-5, 7, 9, 11, 15, 16 and 21 have been amended herein. Claims 21-25 have been canceled herein without prejudice to Applicant's right to file divisional applications to the separately patentable subject matter thereof. Claims 26-30 have been added.

The Amendment

Claim 1 was amended to delete the terms "larger chamber" and "smaller chamber." Claim 1 was also amended to recite that the biopolymer probes are non-diffusively bound to a surface within each of the two chambers. Support therefor is in the specification, for example, page 19, lines 14-20. Claim 1 was also amended to recite that the features of the array are arranged in a predetermined manner. Support therefor is in the specification, for example, page 20, lines 8-9.

Claim 3 was amended to provide proper reference back to claim 1, from which claim 3 depends.

Claim 4 was amended to delete the terms "larger chamber" and "smaller chamber" and to provide proper reference to the chambers recited in the claim.

Claim 5 was amended to provide proper reference back to claim 1, from which claim 5 depends. Claim 5 was also amended to indicate that the features of said one of said chambers comprise a greater number of biopolymer probe molecules per feature than features of said other of said chambers. Support therefor is in the specification, for example, page 7, lines 29-30.

Claim 7 was amended in a manner similar to that for claim 4 above. Claim 7 was also amended to recite that the biopolymer probes are non-diffusively bound to a surface in the interior of the housing. Support therefor is in the specification, for example, page 19, lines 14-20. Claim 7 was also amended to recite that the features of the microarray are arranged in a predetermined manner. Support therefor is in the specification, for example, page 20, lines 8-9.

Claim 9 was amended to recite the full names of CCD and CMOS.

Claim 11 was amended in a manner similar to that for claim 4 above. Claim 11 was also amended to recite that the biopolymer probes are non-diffusively bound to a surface within each of the two chambers. Support therefor is in the specification, for example, page 19, lines 14-20. Claim 11 was also amended to recite that the features of the array are arranged in a predetermined manner. Support therefor is in the specification, for example, page 20, lines 8-9.

Claim 15 was amended to correct a typographical error.

Claim 16 was amended in a manner similar to that for claim 9 above.

Claim 21 was amended in a manner similar to that for claim 4 above.

Claim 26 is new and is directed to a device for conducting binding reactions The device comprises two chambers in fluid communication, wherein one of said chambers has a volume that is greater than a volume of the other chamber. The device also comprises an array of features comprising biopolymer probes, in each of the two chambers. The biopolymer probes are non-diffusively bound to a surface within each of the two chambers. The features of the array are arranged in a predetermined manner and at least some of the features in the interior of said other chamber comprise a greater number of molecules of biopolymer probe per feature than features in the interior of said one of said chambers. Support therefor is in the specification, for example, original claims 1 and 5, and page 19, lines 14-20, and page 20, lines 8-9.

New claims 27-30 find support in the specification, for example, original claims 2, 6, 8 and 9, respectively.

Information Disclosure Statement

The Office Action indicated that the Information Disclosure Statement (IDS) filed 25 November 2003 was acknowledged but was not considered because, alleges the Office Action, most of the references cited lack proper document numbers (setting forth as an example 0,045,274 dated 10 April 2002). The Office Action indicated that the actual documents listed in this manner in the Information Disclosure Statement were not being considered because the actual identities of the documents listed therein are unknown.

Applicant is submitting herewith a supplementary information disclosure statement listing the references in an alternate format. Applicant believes that the

actual identities of the documents as previously submitted are not unknown since the citations in the previous IDS included a document number and a date and the identities of the documents are readily ascertainable. For instance, in the example presented in the Office Action, document 0,045,274 dated 10 April 2002 may alternately be written 2002/0,045,274 or 20020045274 or 2002/0045274 where the year precedes the document number.

Restriction Requirement

Method claims 12-21, which depend from device claim 1, have been withdrawn. As indicated in the previous Office Action, where product claims are elected (such as elected previously) and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provisions of M.P.E.P. §821.04. Claims 12-21 are maintained herein as withdrawn to fulfill the above requirement with respect to withdrawn process claims.

Rejection under 35 U.S.C. §112

Claims 1-11 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant submits that the above amendments to the claims obviate this ground of rejection.

Rejection under 35 U.S.C. §102

Claims 1-2 and 6 were rejected under paragraph (b) of the above code section as being anticipated by Anderson, *et al.* (U.S. Patent No. 6,168,948 B1) (Anderson).

Claim 1 is directed to a device for conducting binding reactions. The device comprises (a) two chambers in fluid communication, wherein one of said chambers has a volume that is greater than a volume of the other chamber, and (b) an array of features comprising biopolymer probes, in each of the two chambers wherein the biopolymer probes are non-diffusively bound to a surface within each of the two

chambers and wherein the features of the array are arranged in a predetermined manner.

Without acquiescing in the arguments in the Office Action, Anderson does not anticipate or suggest the device of claim 1 because Anderson does not disclose or suggest each and every element of claim 1. For example, Anderson does not disclose or suggest an array of features in each of the two chambers. The Office Action contends that the PCR amplification chamber satisfies one element of claim 1. However, the PCR primers in Anderson are present in solution in the chamber and are not an array of features as required by the claim. In addition, claim 1 recites two chambers of different size wherein in each of the chambers biopolymer probes are non-diffusively bound to a surface within each of the two chambers. The amplification chamber of the reference does not satisfy, or suggest, this limitation of the claim because the PCR primers are not non-diffusively bound to a surface in the chamber. Furthermore, claim 1 recites that the features of the array are arranged in a predetermined manner. The PCR primers are present in the amplification chamber of Anderson in solution and are not an array arranged in a predetermined manner.

Without acquiescing in the arguments in the Office Action, claims 2 and 6 depend ultimately from claim 1 and are patentable over the Anderson reference by virtue of this dependency since claim 1 is patentable over Anderson as demonstrated above.

Rejection under 35 U.S.C. §103

Claims 1, 3, 5, and 7-10 were rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson.

Applicant has demonstrated above that Anderson does not teach or suggest the device of claim 1.

Without acquiescing in the arguments in the Office Action, claim 3 depends from claim 1 and is patentable over the Anderson reference by virtue of this dependency since claim 1 is patentable over Anderson as demonstrated above.

Claim 5 is directed to a device as claimed in claim 1 wherein features of said one of said chambers comprise a greater number of biopolymer probe molecules per feature than features of said other of said chambers. Anderson does not

disclose or suggest such a device. The Office Action refers to the disclosure in Anderson of a PCR amplification chamber and a storage chamber containing PCR primers. Such disclosure in the reference is deficient for several reasons. For example, Anderson does not disclose or suggest an array of features in each of the two chambers. Second, the PCR primers in Anderson are present in solution in the amplification chamber and in the storage chamber and are not an array of features as required by the claim. In addition, the amplification chamber of the reference does not satisfy, or suggest, the limitation of the claim that the biopolymer probes in each of the chambers are non-diffusively bound to a surface within each of the two chambers because the PCR primers in the amplification chamber are not non-diffusively bound to a surface in the chamber. Furthermore, claim 1 recites that the features of the array are arranged in a predetermined manner. The PCR primers are present in the amplification chamber and the storage chamber of Anderson in solution and are not an array arranged in a predetermined manner. In addition, the reference does not disclose or suggest the element of claim 5 wherein features of said one of said chambers comprise a greater number of biopolymer probe molecules per feature than features of said other of said chambers. This distinction alone renders claim 5 patentable over the Anderson reference.

The Office Action contends that Anderson's disclosure that the storage chamber has sufficient solution for multiple fluid transfers and that the device has a total PCR reaction volume of 2.5 microliters including the primer solutions means that the smaller PCR chamber has a smaller number of biopolymer probe molecules that the larger storage chamber (i.e., there is more primer solution in the storage chamber than in the PCR chamber; hence, the number of probe molecules [i.e., PCR primers] in the storage chamber is greater than the number of probe molecules [PCR primers] in the PRC chamber).

Such a disclosure is irrelevant to the device of claim 5 for the reasons set forth above. For example, there is no disclosure or suggestion in the reference of features of said one of said chambers comprising a greater number of biopolymer probe molecules per feature than features of said other of said chambers. The primers of Anderson are not in an array and are not non-diffusively bound at feature sites.

The Office Action asserts that it would be obvious to have a device with a smaller chamber and a larger chamber in light of Anderson's disclosure that smaller chambers cool faster than larger volume counterparts with the added advantage that the ability to change temperature rapidly allowing for rapid thermal cycling reactions For reasons similar to those discussed above, Anderson's disclosure that smaller chambers cool faster than larger volume counterparts is also irrelevant to the device of claim 5.

The Office Action contends that Anderson suggests the device of claim 7. Applicant respectfully traverses this rejection. The assertions in the first full paragraph on page 8 of the Office Action are similar to those made in the Office Acton with regard to the rejection of claim 1. Without acquiescing in the arguments in the Office Action, Anderson does not suggest the device of claim 7 because Anderson does not disclose or suggest each and every element of claim 7. For example, Anderson does not disclose or suggest an array of features in each of the two chambers. The Office Action contends that the PCR amplification chamber satisfies one element of claim 7. However, the PCR primers in Anderson are present in solution in the chamber and are not an array of features as required by the claim. In addition, claim 7 recites two chambers of different size wherein in each of the chambers biopolymer probes are non-diffusively bound to a surface within each of the two chambers. The amplification chamber of the reference does not satisfy, or suggest, this limitation of the claim because the PCR primers are not non-diffusively bound to a surface in the chamber. Furthermore, claim 7 recites that the features of the array are arranged in a predetermined manner. The PCR primers are present in the amplification chamber of Anderson in solution and are not an array arranged in a predetermined manner.

In addition, claim 7 recites that the said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value and said one of said chambers comprises probes that are directed to target molecules having expected concentrations that are less than said predetermined value.

The Office Action contends that Anderson teaches a PCR chamber comprising probes having expected concentrations in a sample solution that are equal to or greater than a predetermined value. For example, asserts the Office

Action, PCR requires two primer sequences and, therefore, concludes the Office Action, the PCR chamber has probes for at least one copy of the sequence.

Even if for the sake of argument one were to accept the above proposition as true, the above teaching of Anderson does not suggest the claim limitation of claim 7. As indicated above, claim 7 recites that said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value. In the teaching relied on in the Office Action, there are two primers for each target sequence. The teaching relates nothing relevant to target molecules having expected concentrations that are equal to or greater than a predetermined value. The Office Action frames the issue as "probes having expected concentrations in a sample solution that are equal to or greater than a predetermined value." However, that is not the language of claim 7, which recites that said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value.

For the above reason alone, claim 7 is patentable over the teachings of Anderson. However, this should not be taken as acquiescence in the other arguments made in the Office Action with regard to claim 7.

Without acquiescing in the arguments in the Office Action, claims 8-10 depend ultimately from claim 7 and are patentable over the Anderson reference by virtue of this dependency since claim 7 is patentable over Anderson as demonstrated above.

Claims 1 and 4 were rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson in view of Muller, *et al.* (U.S. Patent No. 5,804,384) (Muller). The Office Action asserts that Anderson teaches all of the elements of claim 4 with the exception of a linear array and that Muller teaches a linear array. Therefore, concludes the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Anderson to incorporate linear arrays as taught by Muller.

For reasons similar to those above for the rejection of claim 1 and claim 7 over Anderson, the reference does not teach or suggest the elements of claim 4 as argued in the Office Action. Anderson does not suggest the device of claim 4

because Anderson does not disclose or suggest each and every element of claim 4. For example, Anderson does not disclose or suggest an array of features in each of the two chambers. The Office Action contends that the PCR amplification chamber satisfies one element of claim 4. However, the PCR primers in Anderson are present in solution in the chamber and are not an array of features as required by the claim. In addition, claim 4 recites two chambers of different size wherein in each of the chambers biopolymer probes are non-diffusively bound to a surface within each of the two chambers. The amplification chamber of the reference does not satisfy, or suggest, this limitation of the claim because the PCR primers are not non-diffusively bound to a surface in the chamber. Furthermore, claim 4 recites that the features of the array are arranged in a predetermined manner. The PCR primers are present in the amplification chamber of Anderson in solution and are not an array arranged in a predetermined manner.

In addition, claim 4 recites that the said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value and said one of said chambers comprises probes that are directed to target molecules having expected concentrations that are less than said predetermined value.

The Office Action contends that Anderson teaches a PCR chamber comprising probes having expected concentrations in a sample solution that are equal to or greater than a predetermined value. For example, asserts the Office Action, PCR requires two primer sequences and, therefore, concludes the Office Action, the PCR chamber has probes for at least one copy of the sequence.

Even if for the sake of argument one were to accept the above proposition as true, the above teaching of Anderson does not suggest the claim limitation of claim 4. As indicated above, claim 4 recites that said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value. In the teaching relied on in the Office Action, there are two primers for each target sequence. The teaching discloses nothing relevant to target molecules having expected concentrations that are equal to or greater than a predetermined value. The Office Action frames the issue as "probes having expected concentrations in a sample solution that are equal to or greater than a

predetermined value." However, that is not the language of claim 4, which recites that said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value.

For the above reason alone, claim 4 is patentable over the teachings of Anderson. However, this should not be taken as acquiescence in the other arguments made in the Office Action with regard to claim 4 and not specifically addressed herein. Since Muller does not cure the above deficiencies with regard to Anderson, the combination of Anderson and Muller does not result in the device as claimed in claim 4.

Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson in view of Wu, *et al.* (U.S. Patent No. 6,221,677 B1) (Wu). The Office Action asserts that Anderson teaches all of the elements of claim 11 with the exception of a linear array and that Wu teaches an elongated web comprising a linear array. Therefore, concludes the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Anderson to incorporate linear arrays as taught by Wu.

For reasons similar to those above for the rejection of claim 1 and claim 7 over Anderson, the reference does not teach or suggest the elements as argued in the Office Action. Applicant has demonstrated that Anderson does not suggest the device of claims 1 and 7 because Anderson does not disclose or suggest each and every element of claims 1 and 7. The above reasoning applies equally to claim 11. For example, Anderson does not disclose or suggest an array of features in each of the two chambers. The Office Action contends that the PCR amplification chamber satisfies one element of claim 11. However, the PCR primers in Anderson are present in solution in the chamber and are not an array of features as required by the claim. In addition, claim 11 recites two chambers of different size wherein in each of the chambers biopolymer probes are non-diffusively bound to a surface within each of the two chambers. The amplification chamber of the reference does not satisfy, or suggest, this limitation of the claim because the PCR primers are not non-diffusively bound to a surface in the chamber. Furthermore, claim 11 recites that the features of the array are arranged in a predetermined manner. The PCR

primers are present in the amplification chamber of Anderson in solution and are not an array arranged in a predetermined manner.

In addition, claim 11 recites that the said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value and said one of said chambers comprises probes that are directed to target molecules having expected concentrations that are less than said predetermined value.

The Office Action contends that Anderson teaches a PCR chamber comprising probes having expected concentrations in a sample solution that are equal to or greater than a predetermined value. For example, asserts the Office Action, PCR requires two primer sequences and, therefore, concludes the Office Action, the PCR chamber has probes for at least one copy of the sequence.

Even if for the sake of argument one were to accept the above proposition as true, the above teaching of Anderson does not suggest the claim limitation of claim 11. As indicated above, claim 11 recites that said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value. In the teaching relied on in the Office Action, there are two primers for each target sequence. The teaching relates nothing relevant to target molecules having expected concentrations that are equal to or greater than a predetermined value. The Office Action frames the issue as "probes having expected concentrations in a sample solution that are equal to or greater than a predetermined value." However, that is not the language of claim 11, which recites that said other of said chambers comprises probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value.

For the above reasons alone, claim 11 is patentable over the teachings of Anderson. However, this should not be taken as acquiescence in the other arguments made in the Office Action with regard to claim 11 and not specifically addressed herein. Since Wu does not cure the above deficiencies with regard to Anderson, the combination of Anderson and Wu does not result in the device as claimed in claim 11.

Conclusion

Claims 1-11 satisfy the requirements of 35 U.S.C. §§112, 102 and 103. New claims 26-30 are patentable over the references, either individually or in combination, for reasons set forth above with respect to, for example, claim 5. Allowance of the above-identified patent application, it is submitted, is in order.

Respectfully submitted,

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